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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,109	06/30/2003	Takahisa Kato	03500.017365	1042

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EXAMINER

HASAN, MOHAMMED A

ART UNIT PAPER NUMBER

2873

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/608,109

Applicant(s)

KATO ET AL.

Examiner

Mohammed Hasan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 14 is/are pending in the application.
- 4a) Of the above claim(s) 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 6, 11- 13 is/are rejected.
- 7) ☒ Claim(s) 7 - 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/222003.
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1- 13 are drawn to an optical deflector, classified in class 359, subclass 298.
  - II. Claim 14 is drawn to a method of producing an optical deflector , classified in class 216, and subclass 24.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as to activate the reflective mirror with a large angle deflection.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification and recognized divergent subject matter, and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Justin J. Oliver a provisional election was made without traverse to prosecute the invention of Group I, claims 1- 13. Affirmation of this election must be made by applicant in replying to this Office action. Claim 14 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Priority***

2. Receipt of acknowledged of papers submitted under 35 U.S.C. 119 (a) – (d), which papers have placed of record in the file.

***Oath/Declaration***

3. Oath and declaration filed on 11/24/2003 is accepted.

***Information Disclosure Statement***

4. The prior art documents submitted by applicant in the Information Disclosure Statement filed on 10/22/2003 have all been considered and made of record (note the attached copy of form PTO – 1449).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1- 3, 6, and 11 – 13 are rejected under 35 U.S.C. 102 (e) as being anticipated by Yagi et al (US 2003/0137711 A1).

Regarding claim 1, Yagi et al discloses (refer to figures1 and 2) an optical deflector comprising: a supporting substrate (10) having an elastic supporting part, a

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moveable plate (1) having a reflective surface on one side thereof and a magnetic material on another side thereof and supported at both ends thereof by the elastic supporting part (i.e., a pair of torsion springs 2) so as to be torsionally vibratable around a torsion axis, a magnetism generating means (e.g., a magnetization state of the permanent magnet 3) provided in the vicinity of and spaced apart from the magnetic material, for driving the moveable plate relative to the supporting substrate to deflect a light incident on the reflective surface, wherein the another side of the movable plate (1) has at least two recesses and the magnetic material is provided in the vicinity of and spaced apart from the magnetic material for driving the movable plate relative to the supporting substrate to deflect a light incident on the reflective surface, wherein the another side of the moveable plate has at least two recesses, and the magnetic material is provided in the recesses (paragraphs 0085 – 0088, paragraph 0076).

Regarding claim 2, Yagi et al discloses, wherein the recesses are spaced apart from the torsion axis of the moveable plate (1) and are not close to the torsion axis (as shown in figure 2).

Regarding claim 3, Yagi et al discloses, wherein the supporting substrate (10), the elastic supporting part (2), the moveable plate (1), and the recesses are integrally formed of single-crystal silicon (paragraph 0076 and paragraph 0085).

Regarding claim 6, Yagi et al discloses, wherein a side wall of the moveable plate (1) has a recess (as shown in figure 1).

Regarding claim 11, Yagi et al discloses () wherein, when viewed from above the surface of the movable plate (1) having the recesses formed therein, the magnetic material overlies the recesses (as shown in figures 1 and 2).

Regarding claim 12, Yagi et al discloses, the optical deflector (paragraph 0009).

Regarding claim 13, Yagi et al discloses the optical deflector, a light source, wherein the optical deflector performs deflection/scanning of a light from the light source to form an image on a projection plane (paragraphs 0002 – 0004).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 5, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yagi et al (US 2003/0137711 A1) in view of Yasuda et al (US 2002/0114053 A1).

Claims 4 and 5 as applied to claim 1, Yagi et al discloses (refer to figure 1) a movable plate (1). Yagi et al discloses all of the claim limitations except the moveable plate having a (100) equivalent plane of a silicon crystal and an inner surface of at least one of the recesses having a (111) equivalent plane of a silicon crystal and elastic supporting part has an x – shaped cross section. Yasuda et al discloses, a single crystal

having (100) and (111) (paragraph 0029) and elastic supporting portion has an x – shaped cross section (paragraph 0031).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a silicon crystal with a (100) –equivalent plane and an inner surface having a (111) –equivalent plane into the optical deflector of Yagi et al for the purpose of angles of the torsion springs is reduced as taught by Yasuda et al (paragraph 0042).

### ***Allowable Subject Matter***

7. Claims 7 - 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to show the recesses each have a substantially vertical side wall in a cross section taken along a line perpendicular to the direction of a width of the movable plate, the recesses are each substantially V- shaped in a cross section taken along a line perpendicular to the direction of a width of the movable plate, a cross section of each of the recesses which is parallel to the second side of the movable plate has a larger area the movable plate than at a surface of the moveable plate, the magnetic material has a substantially circular cross section taken along a line perpendicular to the direction of a width of the moveable plate.



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9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The closest prior art

Miyajima et al (US 2003/0218787 A1) discloses a torsional rocking structural component.

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammed Hasan whose telephone number is (571) 272-2331. The examiner can normally be reached on M-TH, 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272- 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MH  
August 18, 2004

  
Georgia Epps  
Supervisory Patent Examiner  
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